

In The Title:

Please replace the title of the published patent application with the title shown below.

-- OPTICAL ELEMENT, OPTICAL OBJECTIVE ELEMENT, AND OPTICAL PICKUP
APPARATUS HAVING DIFFRACTIVE STRUCTURE AND OPTICAL DIFFERENCE
GIVING STRUCTURE --

In the Specification:

Please amend paragraphs 0031, 0056, 0105, 0108, 0110, 0112, 0115, 0118, 0142, 0145, 0228, and 0408 of the published application as shown below.

[0031] an optical path difference giving structure ~~arranged~~ arranged on an optical surface of at least one of the plurality of diffracting ring-shaped zones, for giving a prescribed optical path difference to a prescribed light beam passing through the diffracting ring-shaped zone,

[0056] In the present invention, the optical element comprises a diffractive structure having a plurality of diffracting ring-shaped zones arranged around an optical axis on at least one optical surface; and an optical path difference giving structure ~~arranged~~ arranged on an optical surface of at least one of the plurality of diffracting ring-shaped zones, for giving a prescribed optical path difference to a prescribed light beam passing through the diffracting ring-shaped zone.

[0105] The plurality of diffracting ring-shaped zones formed on the optical surface of a prescribed ~~aspherical~~ aspherical shape and arranged around the optical axis are arranged, and the optical path difference giving structure is arranged on the optical surface of at least one of the diffracting ring-shaped zones.

[0108] Preferably, the optical surface of the diffracting ring-shaped zone has a structure substantially inclined with respect to the optical surface formed in a prescribed ~~aspherical~~ aspherical shape, the structure substantially inclined having a discontinuous surface formed in a serrate shape, and

[0110] Preferably, the optical surface of the diffracting ring-shaped zone has a structure substantially inclined with respect to the optical surface formed in a prescribed ~~aspherical~~ aspherical shape, the structure substantially inclined having a discontinuous surface formed in a stepped shape along the direction of the optical axis, and

[0112] Preferably, the optical surface formed in the prescribed ~~aspherical~~ aspherical shape is partitioned into a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region surrounding a periphery of the central region,

[0115] Preferably, the optical surface formed in the prescribed ~~aspherical~~ aspherical shape is partitioned into a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region surrounding a periphery of the central region,

[0118] Preferably, the optical surface formed in the prescribed ~~aspherical~~ aspherical shape is partitioned into a central region arranged around the optical axis and formed in an approximately circular shape, and a peripheral region surrounding a periphery of the central region,

[0142] an optical path difference giving structure ~~arranged~~ arranged on an optical surface of at least one of the plurality of diffracting ring-shaped zones, for giving a prescribed optical path difference to a prescribed light beam passing through the diffracting ring-shaped zone,

[0145] In the invention, at least one of the optical elements comprises a diffractive structure having a plurality of diffracting ring-shaped zones ~~arranged~~ arranged around an optical axis on at least an optical surface; and an optical path difference giving structure arranged on an optical surface of at least one of the plurality of diffracting ring-shaped zones, for giving a prescribed optical path difference to a prescribed light beam passing through the diffracting ring-shaped zone.

[0228] Further, the structure 22 having the diffracting ~~function~~ function is set so as to set the diffraction efficiency of the 1st order diffracted light having the wavelength λ_1 to approximately 100%, and the optical path difference giving structure 30 is set so as to give the optical path difference equal to an integral multiple of the wavelength λ_1 to the light beam having the wavelength λ_1 .

[0408] As described above, in the objective optical element according to the present invention, the plurality of diffracting ring-shaped zones arranged around the optical axis are formed at least on a part of the optical functional surface formed in the ~~aspherical~~ aspherical shape, and the optical path difference giving structure having the stepped discontinuous surface is formed on the optical surfaces of the diffracting ring-shaped zones so as to give a prescribed optical path difference for light beams passing through the steps of each diffracting ring-shaped zone.